Cairo University
Computer Engineering Department
Faculty of Engineering

CMPS102 - Programming Techniques

Graded Lab 2

For this lab, you are given a set of problems. Your task is to write code for each problem to read the user input and produce the required output.

Please have all the codes under 1 **solution**, each in its own **project**.

Please make sure to test your code on different inputs and test cases.

Try to think of the possible values the inputs could take.

Make sure to handle any edge cases that might lead to runtime or logical errors.

Make sure your code is tested, and ready before delivering it to the TA.

1. Write a C++ function "**ExtractGradesAndIndices"** that takes an array of student scores, its size, and a specific grade as parameters. The function should find all scores greater than or equal to the specified grade and return two arrays:
   a. An array containing all grades greater than or equal to the specified grade.
   b. An array containing the indices of these grades in the original array.

   If there are no grades greater than or equal to the specified value, display a message stating "No grades found matching the specified value." The function should return the two arrays.
   Note: printing of the final arrays should be done inside the main not inside the function. Remember to deallocate the arrays

Input:
Enter the number of students: 6
Enter the student scores: 85 92 78 96 89 91
Enter the specified grade: 90
Output:
Grades greater than or equal to 90: 92 96 91
Indices of matching grades: 1 3 5

2. You are given an array of integers representing ages of people in a group. Write a C++ function "**CountAdults"** that takes the array of ages and its size as parameters. The function should count the number of adults in the group. Adults are individuals aged 18 and above. Additionally, the function should check if all ages are adults. If all ages are adults, return true; otherwise, return false and calculate the count of non-adults in the group. **The size of the array is 10 and read the array elements from the user.** **Note: The output should be printed in the main, not inside the function.**

Input:

Enter the ages of 10 people: 25 19 33 17 22 18 30 16 21 27

Output:

Number of adults: 8

Number of non-adults: 2

Not all ages are adults.